

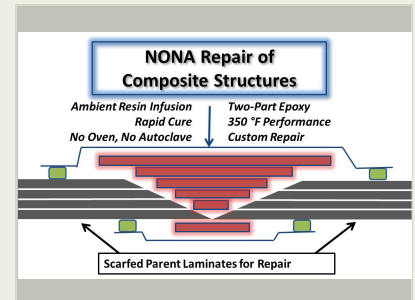
NONA Repair of Composite Structures, Phase I

Completed Technology Project (2016 - 2017)



Project Introduction

While much attention is necessarily focused on the evaluation and certification of the materials and processes involved in adhesive bonding, development is still needed in decreasing the cost, time, and complexity of the current repair concepts. A material and processing system is needed that allows the design, infusion, and cure of composite repairs without the current roadblocks imposed by ovens, autoclaves, and expensive tooling. VARTM processing of custom repairs allows freedom in design and minimizes the specialized tooling required for patches and straps that are prefabricated apart from the structures needing repair. CRG's no-oven, no-autoclave (NONA) composite processing technology enables the fabrication of high-performance composite parts without the limitations imposed by autoclaves and ovens. NASA originally funded CRG to develop the materials and processes for the manufacture of large, single-piece space launch structures. Building on that activity, CRG proposes NONA repair of composite structures. In this concept, NONA resin is introduced to a scarfed surface and dry fiber via VARTM processing and undergoes complete cure without additional heat input. NONA offers the opportunity to repair PMC structures on-site without the use of large capital equipment. The University of Dayton Research Institute will conduct the scarfing and evaluation of test materials. The resin consists of common aerospace epoxy components, but it is formulated to achieve complete cure in a matter of hours without additional heat input. The two-part epoxy system uses its own chemical energy to propel itself through a complete cure. It provides good strength, chemical resistance, and thermal performance up to 350 deg. F. CRG envisions a mobile fleet of NONA composite technicians that can perform repair activities at manufacturing sites around the world, restoring functionality to damaged structures and tools, minimizing impact on plant operations and production.



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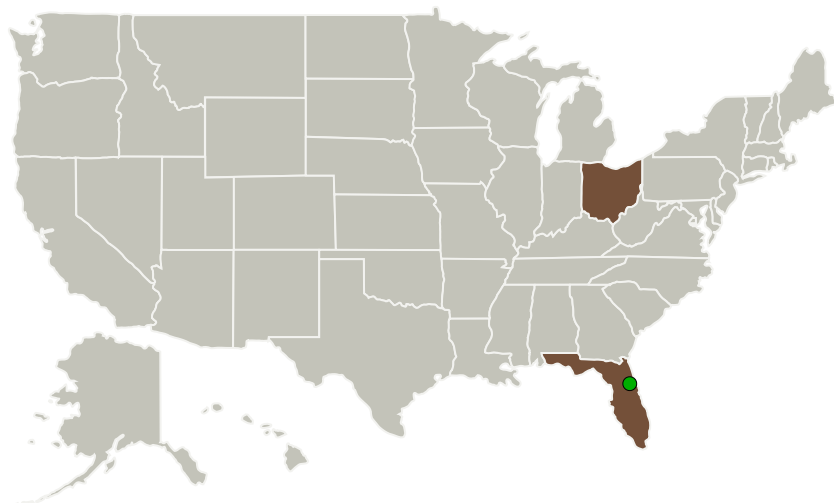
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
● Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida
University of Dayton	Supporting Organization	Academia	Dayton, Ohio

Primary U.S. Work Locations

Florida	Ohio
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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Cornerstone Research Group, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Michael D Rauscher

Co-Investigator:

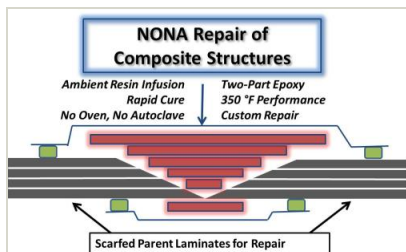
Michael Rauscher

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Images



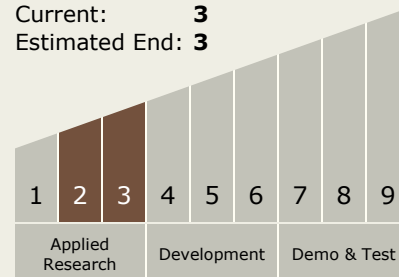
Briefing Chart Image

NONA Repair of Composite Structures, Phase I

(<https://techport.nasa.gov/image/128063>)

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - TX12.1 Materials
 - TX12.1.1 Lightweight Structural Materials